

Enclosure 1.5.

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AMENDED CLAIMS

1. A thermosetting resin SMC article containing a radically curable resin mixture as matrix, in which 2D-randomly distributed, discontinuous carbon fibres and other additives are present, characterized in that the radically curable resin mixture consists of:
  - (a) 50-100 parts by weight of a radically curable resin that also contains a free monomer capable of copolymerising with it
  - (b) 0-50 parts by weight of a shrink-resistant compound that may also contain an amount of copolymerisable free monomer, the total of (a) and (b) adding up to 100,and in that the discontinuously distributed carbon fibres are obtainable by chopping split, continuous carbon fibre bundles, which carbon fibre bundles are provided with a sizing that is at least partially chemically bonded thereto and with a binder whose solubility at room temperature in the copolymerisable free monomer present in the radically curable resin mixture amounts to at least 10% by weight, wherein the sizing and binder may be the same component or different ones,  
and in that the weight percentage of carbon fibres relative to the resin composition is between 5 and 65% by weight,  
and in that optionally also a filler is present in the resin composition.
2. A thermosetting resin SMC article according to Claim 1, characterized in that the discontinuously distributed carbon fibres are obtainable by chopping split, continuous carbon fibre bundles having a K value of  $\geq 20$ , preferably  $\geq 40$ , in total, and being composed of packages of carbon filaments each having a K value of between 1 and 12, preferably of between 3 and 12.
3. A thermosetting resin SMC article according to Claims 1-2, characterized in that the radically curable resin is a vinylester resin or an unsaturated polyester resin.
4. A thermosetting resin SMC article according to any one of Claims 1-3, characterized in that the copolymerisable free monomer is styrene.
5. A thermosetting resin SMC article according to any one of Claims 1-4, characterized in that the shrink-resistant compound is chosen from thermoplastic polymers and/or styrene-butadiene rubbers.

AMENDED SHEET

Enclosure 1.6.AMENDED CLAIMS (continued)

6. A thermosetting resin SMC article according to any one of Claims 1-5, characterized in that the weight percentage of carbon fibres relative to the resin composition is either between 5 and 30% by weight or between 40 and 60% by weight, preferably between 45 and 58% by weight.
7. A thermosetting resin SMC article according to any one of Claims 1-6, characterized in that the average length of the chopped, split, continuous carbon fibre bundles is between 0.5 and 10 cm, preferably between 1 and 5 cm.
8. A thermosetting resin SMC article according to Claim 7, characterized in that the average length of the chopped, split, continuous carbon fibre bundles is not shorter than 2 cm.
9. A thermosetting resin SMC article according to Claim 7, characterized in that at the average length distribution of the chopped, split, continuous carbon fibre bundles there are at least two maxima in the length distribution.
10. A thermosetting resin SMC article according to any one of Claims 1-9, characterized in that the amount of filler is at most 75% by weight relative to the resin composition.
11. A thermosetting resin SMC article according to Claim 10, characterized in that less than 5% by weight, in particular less than 0.1% by weight and most preferably less than 0.01% by weight of filler is present in the resin composition.
12. A thermosetting resin SMC article according to any one of Claims 1-11, characterized in that the sizing and the binder are one and the same compound.
13. A process for the preparation of a thermosetting resin SMC article containing a radically curable resin mixture as matrix, in which 2D-randomly distributed, discontinuous carbon fibres and other additives are present, characterized in that split, continuous carbon fibre bundles are chopped in a chopper to form packages of carbon filaments, with the carbon fibre bundles prior to chopping being provided with a sizing that is at least partially chemically bonded thereto and with a binder, which may be the same component as the sizing or different therefrom, and are added to a radically curable resin mixture consisting of:

Enclosure 1.7.AMENDED CLAIMS (continued)

- (a) 50-100 parts by weight of a radically curable resin that also contains a free monomer capable of copolymerising with it
- (b) 0-50 parts by weight of a shrink-resistant compound that may also contain an amount of copolymerisable free monomer, the total of (a) and (b) adding up to 100,

as well as optionally an amount of filler, the binder's solubility at room temperature in the copolymerisable free monomer that is present amounting to at least 10% by weight, and the chopped, split, continuous carbon fibre bundles being distributed 2D-randomly and homogeneously therein by either

- 1) allowing them to drop on an SMC line onto the resin mixture and covering them with the same resin mixture, or
- 2) adding them to the resin mixture in a gap between two counter-rotating rolls followed by an impregnation step in a compacting unit or in a mixing apparatus.

- 14. A process for the preparation of a thermosetting resin SMC article according to Claim 13, characterized in that the packages of continuous carbon filaments each have a K value of between 1 and 12, preferably of between 3 and 12, and are obtained by splitting unsplit continuous carbon fibre bundles having a K value of  $\geq 20$ , preferably  $\geq 40$ , in total.
- 15. Process for manufacturing 3D-moulded articles, characterized in that in the manufacture thereof a thermosetting resin SMC article as described in one of Claims 1-12 is used.